Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20510

In the Matter of	)	
	)	PP Docket No. 92-234
Inquiry into Encryption Technology	)	
for Satellite Cable Programming	)	

REPLY COMMENTS OF GENERAL INSTRUMENT CORPORATION

General Instrument Corporation ("GI") submits these Reply Comments in connection with the above captioned Notice of Inquiry into Encryption Technology for Satellite Cable Programming ("Notice" or "NOI").

TABLE OF CONTENTS

		Page
I.	Summary	
II.	General Discussion of Comments in This Proceeding	2
III.	Titan Has Failed to Demonstrate the Feasibility or Compatibility of Its System with An Evolving VideoCipher® RS Technology	3
IV.	Dectec's Comments Are Misleading	11
V.	The Consumer Satellite Coalition's Comments are Misleading and Ill Informed	12
VI.	Aspects of the Comments of Scientific-Atlanta Require Further Response, Including Additional Discussion of MPEG Standards	13
VII.	Conclusion	18

I. Summary

The Comments filed in this proceeding recognize that widespread technological changes are imminent for the home satellite dish ("HSD") market but that these changes do not warrant government intervention or regulation, at least not at this time. They also show

that Titan Company has failed to demonstrate the feasibility of compatibility of its system with an evolving VideoCipher® RS technology. Among other comments, those of Dectec and the Consumer Satellite Coalition are misleading. Scientific-Atlanta's comments fail to appreciate all aspects of the international standardization processes currently underway.

II. General discussion of Comments in this proceeding.

As a general proposition, we note that the comments filed in this proceeding recognize that technologies supporting the HSD market, as well as other markets, are developing rapidly. While analog satellite signals will continue to be supplied to the HSD market for the foreseeable future, these are likely to be supplemented by digital television signals, a technology that is certainly the wave of the future. Despite the fact that major announcements have been made about the use of digital compression in the delivery of satellite and cable television signals, it is still very early in this process to predict exactly how these new technologies will develop. Nevertheless, there is widespread recognition, reflected in the comments responding to this Notice, that government regulation and standard setting is only likely to retard rather than advance this emerging technology. In short, the most efficient arbiter among competing forms of technology -- the competitive market -- should remain free to determine the outcome.

While there is dispute over the level and extent of competition which currently exists in the supply of encryption equipment to that market, there is widespread recognition, even among those who voice a desire for the entry of an additional equipment supplier, that concern about security remains a paramount issue. Any competitive system developed must include demonstrated consistency with the requirements of security.

Titan Satellite Systems Corporation ("Titan") should have the burden of demonstrating the feasibility of incorporating its system into the existing encryption and access control system used by the HSD market, particularly with respect to security requirements. We conclude that Titan has failed in its comments to make even a *prima facie* case that its plans for the future are feasible. The ability to make use of some of the patents on which the earlier VideoCipher® II technology was based does not establish that *prima facie* case since the security of that system has been badly compromised.

In these Reply Comments, we will discuss this more fully with respect to Titan, addressing those aspects of the Titan comments which warrant further discussion. We will also address a few other matters raised by other commentators.

II. Titan has failed to demonstrate the feasibility or compatibility of its system with an evolving VideoCipher RS® technology.

In our comments, we stated that we lacked information concerning Titan's technology and business proposal and awaited its comments in this proceeding in anticipation that Titan's comments might shed some light on its business plan and technology. We hoped that Titan's submission might provide specifics on its plans to supply scrambling and descrambling technology, the technical capabilities of the Titan system and its ability to limit the threat of satellite signal theft. Titan's lengthy submission is replete with factual inaccuracies and mischaracterizes the record, but fails to clearly and meaningfully describe the technical aspects of its technology and how it will maintain system security. While we regret that Titan's incomplete submission limits our ability to further contribute to this Inquiry, we feel it important to respond on the record to some of the material misstatements submitted by

Titan.

Titan states:

> "... it is possible and, we believe, desirable to have competing encryption and conditional access systems that coexist in the same signal, even though they are 'imperfectly compatible,' i.e., different cryptographically, and hence invisible to each other as long as compatibility exists at some level. For example, the VCRS and LSCS systems operate with, and require, the same program key (although this key is encrypted differently for the transmission of program 'rekey' messages - so that one system is invisible to the other) and the identical working key (the lowest level in the key system hierarchy)." [1]

The program key referred to is the common system key that typically changes with each program. All system categories, whether commercial or consumer, provide access control through this fundamental element. This is a critical element in that access to a program key is all that a "pirate" requires to receive unauthorized programming and hence break the VideoCipher® Plus/RS and Titan decoders. While VideoCipher II security breaks have historically occurred at levels in the key hierarchy above the program key, any successful assault on the Titan implementation of the VideoCipher II key hierarchy at or above the program key level will yield the common program key. The technology Titan intends to implement based upon the VideoCipher II key hierarchy has fundamental weaknesses which have been addressed in VideoCipher® II Plus and VideoCipher® RS technology.[2] As a result of these weaknesses and known pirate techniques of invading security hardware, program theft at or above the program key level is a likely consequence

---

[1] Titan Comments, p. 24.

[2] Unlike the present VC Plus/RS system, for example, the VCII key hierarchy is susceptible to the "Three Musketeer" or "all for one" break, allowing all services to be received when the modified module was actually authorized for only one service.

of Titan's proposed implementation.

Titan's acknowledgement that any system sharing compatibility with the VideoCipher system requires the same program key raises other concerns. As we stated in our comments, the consequence of using the same program key is that if the security of one system is breached, the breach unavoidably impacts the other system since the pirate community may circumvent the more secure system by exploiting the deficiencies of the insecure system. The security breach will not be limited to Titan's decoders, but could affect GI's VideoCipher II Plus and VideoCipher RS products as well, exactly as occurred with different generations of VideoCipher II product. This inherent weakness is present regardless of actions taken to separate the two independent systems. Coexistent systems with different security levels are analogous to having two different lock boxes on your house, with different levels of accessibility. It is absurd to claim that if one lock box is broken, that does not affect the other lock box - both boxes contain the identical key to the home.

A requirement that the VideoCipher RS and LSCS systems operate with the same program key will also make it more difficult and expensive to respond to security breaches. GI's programs to combat piracy have historically included making fundamental changes to the VideoCipher system design. These changes have twice included revisions to program key processing. The VideoCipher RS architecture has been designed to maximize flexibility in connection with GI's continuing efforts to provide a secure environment. Based upon our prior experience, it is likely that a response to a pirate attack will require a change to the method of processing the program key. As we understand the Titan system, this change will disable Titan's descramblers as well as pirate units which are the intended targets. It is also

important to note that these system design improvements which enhance the security of our products include much patented technology which is not part of the patent rights Titan claims it acquired. Were GI constrained in its ability to change the method of processing the program key and/or the working key, the effectiveness of both TvPass Card and planned security changes to uplink scrambling equipment would be greatly diminished.

Titan comments extensively upon the transmission of signals in the horizontal blanking interval ("HBI") which has historically been used for transmission of VideoCipher II consumer and commercial authorization messages. Transmission of VideoCipher II Plus and VideoCipher RS messages is done in the vertical blanking interval ("VBI"). Titan suggests that actions taken by GI to limit HBI use are anti-competitive in nature and initiated to block Titan's entry into the marketplace. These statements are not true.

As stated in our comments in this Inquiry, GI determined it was necessary to break cleanly with the VideoCipher II system and move to the VideoCipher II Plus and VideoCipher RS. As part of that decision, and long before Titan announced its plans to enter the encryption business for the HSD market, a research and development project for an improved scrambler was initiated to develop equipment that would permit the phase out of the VideoCipher II signal. This project determined that the most effective method of combatting piracy of the VideoCipher II system included eliminating the HBI authorization stream completely. Improving the scrambler to remove this vulnerability simply represents another step in GI's multi-phase program to maintain ongoing security in the marketplace. It represents a first step to upgrade programmers' uplink scramblers to ensure that pirated VideoCipher II units are disabled and the old hardware cannot be reused.

We are concerned about Titan's statement that it plans to install a message processor unit ("MPU") at each programmer's uplink. This hardware will be located between two elements of the GI VideoCipher scrambling system, the Channel Control System ("CCS") computer and the scrambler. GI is greatly concerned about the possibility that this approach will threaten system security given that GI will have no knowledge about the security levels inherent in Titan's MPU. Under Titan's proposal, the MPU will intercept and reprocess the entire VideoCipher commercial data stream. This involves processing the most critical messages in the entire VideoCipher system through hardware designed, implemented and maintained by Titan, outside of GI's control. Breaking into the MPU would, therefore, represent a complete system breach.

Performance and reliability degradation may also arise from Titan's plans. For example, there will be an increase in the acquisition time it takes a consumer switching between program offerings on two different satellite channels because of the additional information in the same data channel. System reliability will also potentially be impacted. As discussed above, the entire VideoCipher commercial data stream will pass through Titan's MPU. Because Titan and GI hardware and software have been designed and developed with neither party having the benefit of the other's confidential specifications, it is almost inconceivable that the systems will be completely compatible. Any incompatibility could result in malfunction or failure of the entire system.

Titan's proposal also has significant implications in connection with the uplink scrambling equipment maintenance services GI provides to many of its programmer customers. The introduction of a new component into the system will dramatically increase

the difficulty of providing on-going hardware and software maintenance services and diagnosing and remedying acute system problems.

Titan would like the Commission and the industry to believe that the upgrade of some commercial VideoCipher II descrambler units to commercial VideoCipher RS technology is being undertaken to undermine Titan's ability to compete. This assertion is absurd. Many of the commentators in this Inquiry stated that satellite pirates are now attacking the VideoCipher system by attempting to steal VideoCipher II commercial keys and using them to illegally authorize old modified VideoCipher II consumer descramblers. GI is working diligently with programmers in the industry to implement commercial descrambler and uplink upgrades. The upgrade to commercial VideoCipher RS descramblers defeats this pirate technique and represents a step towards having a complete and more secure VideoCipher II Plus/RS only system. Programmers will decide the appropriate time for such upgrades.

Titan extensively discusses the pricing of descrambling modules and differences between its announced pricing policy compared to the current GI list price. Without repeating our discussion of the economics of security provided in our comments in the Inquiry, we think it important to emphasize the very substantial expenditures made by GI to enhance security and the ongoing commitment in research and development expenditures undertaken by GI. We know from past experience that a security commitment requires substantial financial and technical resources. After reviewing Titan's comments, we have no better idea of the commitments it is prepared to make to commercial and consumer customers with regard to these important issues.

Furthermore, it is difficult to understand how, in a matter of months with no previous DBS satellite experience, a secure Titan decoder will be fielded. Certainly it is understandable that, not burdened with the knowledge and commitment to security that VideoCipher II Plus has demonstrated, Titan can sell for $249 per module and be profitable to its investors. The investors in Titan include one of the largest manufacturers of consumer satellite equipment in the United States, Houston Satellite Systems, Inc. The principal owner of Houston Satellite Systems, Inc. is also the principal owner of Echosphere Corporation, also one of the largest distributors of consumer satellite equipment in the United States. The market share of these companies, on a combined basis, has increased handsomely since the advent of scrambling in 1986. Titan attempts to demonstrate that the "typical" retail price of a VideoCipher RS module is $717.95. This greatly distorts the actual price consumers pay for VideoCipher modules. Attached as Exhibit A are recent advertisements from satellite television publications that document the actual consumer pricing under "open distribution".

In response to the request of a majority of its manufacturing licensees, GI implemented open distribution of descramblers and suspended the contractual requirement of descrambler integration into a satellite receiver prior to sale. The market effect of this change was three-fold. One, it made descramblers more accessible to consumers as it significantly broadened availability of outlets for decoders. Two, VideoCipher licensed satellite receivers could now be sold without a descrambler which allows direct comparative pricing of satellite receivers to the ultimate benefit of consumers. Three, open distribution reduced the end consumer retail price because the middlemen (distributors like Echosphere

and manufacturers like Houston Satellite) were not able to mask their mark-ups on the descrambler. It is ironic that Echosphere, one of the most vocal critics of GI, is now voicing significant complaints about the lack of its profitability on descramblers. In fact, it is our understanding that Echosphere and Titan are touting significant increases in Titan descrambler profitability to distributors and manufacturers. As a consequence, we believe that their announced intention to sell descramblers at $249 per unit will not be reflected in lower prices at the consumer level but rather will be taken as additional profit by distributors and manufacturers.

Titan asserts that if programmers continue to be unwilling to use its system, this is the result of GI's "abusive (sic) of monopoly power and patent positions." Titan's position is illogical. Titan conveniently fails to consider that from the programmers' perspective, a critical factor in assessing an encryption supplier is whether a competitive product will create security risks. Given the investment that programmers and GI have made to overcome VideoCipher II piracy and to establish a secure marketplace, it is understandable that programmers will consider whether endorsing Titan's system will put the security of their existing equipment at risk and create an unintended link between their existing product and the untested Titan technology.

In its comments HBO stated it will only consider an alternative encryption technology without any links to, and which does not use, the compromised VCII or VCII - like technology transmitted in the HBI.[3] We believe many other programmers, after carefully evaluating all the issues inherent in providing a secure encryption system and features, will

[3] HBO Comments, p. 13.

reach a similar conclusion. We think these decisions will be based upon the merits of the respective systems.

In summary, the presence of Titan's so called "compatible system" will severely limit GI's ability to respond to security breaches. It is likely that a security break will put GI and programmers in the unenviable position of being forced to choose between an effective security response or continued compatibility with Titan products.

We note that Titan has undertaken to develop its own DBS Authorization Center. Titan's decision is another concrete illustration that the cost of building and operating an authorization center can be relatively modest and that the GI DBS Center is not an essential facility. We do, however, disagree with Titan's observation that there are no technical barriers to joint use of an authorization center. For the reasons extensively discussed in our comments previously submitted, we believe there are significant security implications of increased access to the DBS Center and other technical limitations that counsel against such access.

IV. Dectec's Comments Are Misleading

At the risk of dignifying Dectec International, Inc's ("Dectec") comments by reply, it is important to respond to its grotesque misstatements. Dectec asserts that its emulation of the VideoCipher® II system does not make use of any processes proprietary to GI. This is untrue. In a legal proceeding pending against Dectec, GI alleged, *inter alia*, that Dectec infringed a variety of GI patents and copyrights and First Choice, a Canadian programming service, which is also a plaintiff in the action, alleged that Dectec infringed its rights and copyrighted programming. In short, GI and First Choice believe that Dectec has

misappropriated GI technology for the purpose of misappropriating First Choice and other programming to which Dectec has no right.[4] The Federal Court of Canada issued a preliminary injunction against Dectec and its principals in January, 1991, which remains in place today. In exhibits to its filing, Dectec included information concerning its application to hold GI in contempt of court. Dectec's application was denied on January 6, 1993. We are confident that GI will also prevail when the Canadian Federal Court considers the substantive issues in this case.

V. The Consumer Satellite Coalitions' Comments Are Misleading and Ill Informed

The Consumer Satellite Coalition and its founder and legislative director, Ms. Suzanne Baechler, have frequently made unsubstantiated allegations, false accusations and misstatements about GI and its products.[5] We believe the Consumer Satellite Coalition greatly undermines its credibility when it recommends that the Commission review the merits of the S.U.N. decoder manufactured by Dectec. For the reasons previously mentioned, favoring the product offerings of a company facing the serious charges brought against Dectec in the Federal Court of Canada is ill advised.

---

[4] We are wary of taking counsel from the fox regarding how best to secure the henhouse.

[5] GI has undertaken substantial efforts to provide excellent customer service and to respond to Ms. Baechler's complaints including sending a specially trained technician from our Hickory, North Carolina facility to Ms. Baechler's residence in Macon, Missouri. In that regard, we submit in Exhibit B correspondence between GI and the Attorney General of Missouri concerning a complaint filed by Ms. Baechler.

VI. Aspects of the Comments of Scientific-Atlanta Require Further Response, Including Additional Discussion of MPEG Standards

Scientific-Atlanta's comments concerning the Commission's historical description focus upon consumers owning VideoCipher II Plus units that are not covered by the consumer security protection program. We observe that owners of VideoCipher II Plus modules were not affected in any way by actions related to the VideoCipher II upgrade and the shut down of the VideoCipher II consumer authorization data stream. Additionally, GI has stated to VideoCipher II Plus module owners that are not covered by the consumer security protection plan that if in the future changes in signal transmission are necessary due to a security break, GI will work with other industry participants to develop an industry-wide program that will address the needs of such consumers.

We view Scientific-Atlanta's comments on competition in the provision of VideoCipher II decoder modules as an implicit endorsement of the VideoCipher II Plus technology and recognition that the VideoCipher II has been fatally compromised. We note that Scientific-Atlanta does not comment on the technical feasibility of Titan's proposed plans, but rather focuses upon proposed changes to the current VideoCipher II Plus/RS marketplace.[6] With regard to licensing issues raised by Scientific-Atlanta, as mentioned in our comments, GI already licenses a second source to produce VideoCipher decoders in competition with GI. GI also has licenses with numerous integrated receiver descrambler manufacturers, including Scientific-Atlanta, for consumer and/or commercial products. We

[6] See Scientific Atlanta Comments, pp. 4-6.

note the Commission stated it did not seek to reopen the issue of mandatory encryption standards. We do not believe that a debate over GI's historical and present licensing policies is useful or called for in the present Notice of Inquiry.

With regard to DBS Authorization Center access, we note that Titan's decision to build its own authorization facility is further evidence that the cost of building and operating an alternative authorization center does not represent a significant barrier to new entrants into the marketplace.

Scientific-Atlanta's discussion of other technological issues discusses the perceived advantages of "interoperability" for digital video systems. It continues to be GI's belief that the marketplace and customers are best able to satisfactorily address issues of equipment compatibility. With regard to GI's introduction of equipment employing digital technologies, we observe that our customers continue to define their equipment needs. The systems ultimately delivered by GI will include functionality, features and refinements requested by our customers. Any requirements of interoperability are best defined and addressed by the customers for whom we design and manufacture equipment. Mandated interoperability through governmental intervention is unnecessary.

In GI's response to the Notice of Inquiry, we provided some general comments related to the evolving Moving Pictures Experts Group (MPEG) standard(s). Partially in response to Scientific-Atlanta's comments, we take this opportunity to develop further some of our earlier comments.

In 1988, MPEG, a committee of the International Standards Organization (ISO), began an international standardization process for a digital video and audio coding

technique. This original effort is now called MPEG-1, and is titled "Coding of Moving Pictures and Associated Audio for Digital Storage Media up to About 1.5 Mbit/second". MPEG-1 is essentially finalized as an ISO standard, with the exception of the conformance testing section.

In 1991, the MPEG committee began a new effort called MPEG-2. MPEG-2 was originally intended to be a "generic" video/audio coding standard for any and all applications at bit rates up to 10 Mbps. The plan at that time was for a follow-on effort called MPEG-3 for higher bit rates, such as those required for HDTV. In 1992, the MPEG-3 effort was abandoned along with the elimination of the 10Mbps upper bit rate limit on MPEG-2. At about the same time, a new effort called MPEG-4 was initiated for audiovisual coding at very low bit rates. The MPEG-4 process is intended to become an official work item under ISO in the near future, and a standard based on MPEG-4 may be achieved by a mid-1990s time frame.

As of November 1992, the schedule of MPEG-2 is:

First Working Draft	November 1992
Second Working Draft	March 1993
Committee Draft	November 1993
Draft International Standard (video, systems)	March 1994
Draft International Standard (audio)	November 1994
International Standard (video, systems)	March 1995
International Standard (audio)	November 1995

Both MPEG-1 and MPEG-2 consist of video, audio and systems specifications.

Transmission techniques (e.g. modem, forward error correction, adaptive equalization) are not specified by the MPEG committee, nor are encryption/conditional access methods. The MPEG-2 video specification will be heavily based on that of MPEG-1, with some differences, for example, to accommodate the ability to compress interlaced video. The MPEG-2 audio specification is still being defined, and is intended to be a multi-channel audio coding technique with backward compatibility to MPEG-1 audio (MUSICAM). The MPEG-2 systems specification is also still being defined, and the extent to which it will be based on the MPEG-1 systems specification is unclear at this time.

Scientific-Atlanta states:

> "...it would be foolish and risky for any one of the industries involved, including the back yard dish market, to launch a digital video compression service that did not consider the MPEG II standard".[7]

Over the last two years, many U.S. cable operators and programmers as well as CableLabs, have closely analyzed all available digital video compression technologies, including MPEG, which would allow them to implement and take advantage of digital television. In the cases of TCI, HBO and PBS, the result of this lengthy process was the selection in late 1992 of the GI/AT&T jointly-developed compression technology.

GI's major concerns relating to MPEG-2 have focused on schedule and cost. The MPEG-2 schedule is outlined above. Cost is a major issue since MPEG-2 is heavily based on the MPEG-1 standard, which was designed for computer and digital storage applications where cost is less of a critical issue. A further problem with MPEG-2 is that the MPEG committee decided to not allow any new video compression algorithm proposals to be

---

[7] Scientific Atlanta Comments, p. 9.

submitted for consideration after the November 1992 MPEG meeting. This makes MPEG-2 particularly inappropriate for HDTV applications, since neither MPEG-1 nor MPEG-2 were designed or optimized for HDTV resolutions.

Scientific-Atlanta makes the additional comment:

> "In fact, both TCI, HBO and Viacom have announced that they will be using systems for digital video transmission which are compatible with MPEG-2."[8]

This statement mischaracterizes the announcements made by TCI and HBO in adopting the GI/AT&T compression system. The December 2, 1992 TCI press release announcing TCI's selection of the GI/AT&T digital television system states:

> "The Company believes this equipment and related systems will be consistent with international standards now being finalized by the Moving Pictures Experts Group II ("MPEG II")."

The HBO press release, announcing its selection of DigiCipher™, with a transition to the GI/AT&T compression system, does not mention MPEG, but does state:

> "...the choice of the GI/AT&T compression system came after the pay TV service examined and tested a number of compression options."

Relating to TCI's announcement, GI and AT&T have been working together to submit the GI/AT&T joint compression technology into the MPEG-2 process. Our goal is to have the GI/AT&T technology recognized as an entertainment subset of the MPEG-2 standard for potential use on a worldwide basis for multi-channel digital television applications, and for any applications requiring a combination of excellent picture quality and cost-effective decoders.

With respect to Scientific-Atlanta's discussion of "interoperability", we observe that

---

[8] Scientific Atlanta comments, pp. 9-10.

matters of crucial concern to digital television transmission (e.g. modulation techniques, forward error correction techniques and codes, adaptive equalization, and encryption/conditional access) are not addressed by the MPEG process. This may partially reflect the fact that U.S. broadcasters have not been directly involved in the MPEG process. It is misleading for Scientific-Atlanta to equate an implementation of MPEG-2 with "interoperability", since the MPEG standards are confined to video and audio compression, which are only two of several technical elements required in a complete digital television system.

Finally, GI remains sensitive to the need for U.S. companies to work with the MPEG process without ceding core technologies in digital TV/HDTV to foreign electronics companies. U.S. companies such as GI and AT&T are the leaders in digital television technology, and it would be unfortunate to discard this leadership position. We believe the Commission and other agencies of the U.S. Government should be similarly concerned.

VII. CONCLUSION

The Comments filed in this proceeding provide no basis for government intervention into encryption and access control technologies in use in the C-Band HSD market. The

Commission's Report should so conclude.

Respectfully submitted,

Quincy Rodgers
Associate General Counsel;
Director, Government Affairs
General Instrument Corporation
1899 L Street, Suite 500
Washington, D. C. 20036
202/833-9700

Of Counsel:
Philip L. Verveer
Daniel R. Hunter
WILLKIE FARR & GALLAGHER
1155 21st Street, N. W.
Washington, D. C. 20036

January 26, 1992

A

NETLINK T.V. TOURS TELEVISION VARIETY

So Much To SEE, So Little TIME.

The *Premier* programming package is loaded with 20 of the most popular channels, plus one of two premium channel combinations...

SHOWTIME and [The Movie Channel]

OR HBO and cinemax.

Or, choose the Connoisseur programming package and see it all! You'll get television's Top 20 channels, *PLUS* HBO cinemax ENCORE and your choice of SHOWTIME or [The Movie Channel] or The Disney Channel.

Only Netlink T.V. Tours packs it all in the most convenient way to go!

VCRS	Price
$549	$642.60
(249)	(342.60)
$300	$300.00

Premier

abc · Bravo · USA · NBC · CNN · Headline News · CBS · TBS · PBS · WGN Chicago · A&E · The Weather Channel · ESPN · Discovery · LIFETIME · PRIME · TNN

SHOWTIME AND [The Movie Channel]

OR

HBO

AND

cinemax

$249.00

Annual Only

Connoisseur

abc · Bravo · USA · NBC · CNN · Headline News · CBS · TBS · PBS · WGN Chicago · A&E · The Weather Channel · ESPN · Discovery · LIFETIME · PRIME · TNN

ENCORE HBO cinemax

AND YOUR CHOICE OF

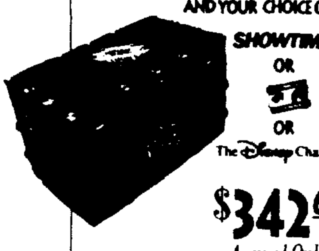
SHOWTIME

OR

[The Movie Channel]

OR

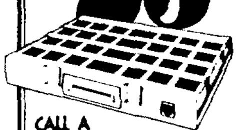
The Disney Channel



$342.60

Annual Only

$25 ADD A VIDEOCIPHER® RS MODULE TO YOUR TV TOURS PACKAGE AND SAVE!†



CALL A NETLINK DEALER FOR INSTALLATION AND GET A $25 PROGRAMMING RENEWAL CREDIT!

Our package choices and low prices look great with a VCRS™ module!

TV Tours programming package plus module:

Premier $549.00

Connoisseur $642.60

†$15 two-day shipping and handling added to order. Local sales taxes may apply.

Module savings are available only with purchase of Deluxe, Premier, Connoisseur or One Stop pre-paid annual packages from Netlink. A $50 surcharge will be assessed against package price if programming is cancelled before subscription period ends. Module covered under standard manufacturer's warranty. Limited time offer. Offer may be withdrawn at any time.

Make One Call And See It All.

800-642-8080

24 hours a day • 7 days a week

NETLINK

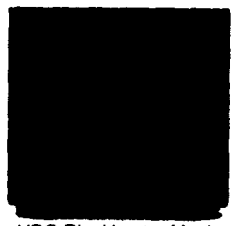
Bringing All Your Choices Together

Limited time offer. Offer may be withdrawn at any time.

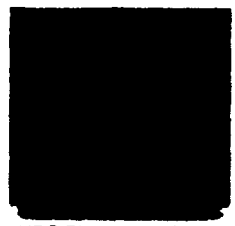
All prices subject to change. A $5.00 authorization fee and local sales tax may apply. *ABC, NBC, CBS and PBS Denver networks are available only if local off-air network signals are not clearly received by antenna or via cable in the last 90 days. **Territorial restrictions may apply.

HOW TO AVOID INTERFERENCE

Here's what you get in SuperPak Plus with multiplex HBO & Cinemax:



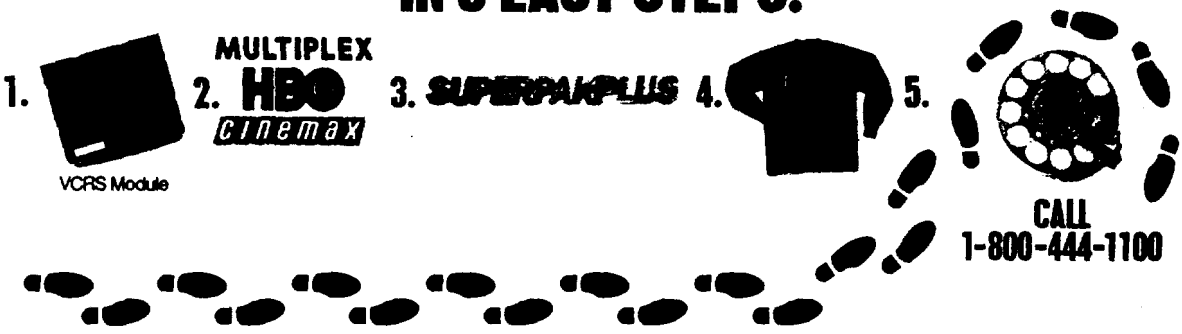
HBO Blockbuster Movie: The Prince Of Tides



HBO Blockbuster Movie: Grand Canyon

HBO Original Movie: Blind Side

IN 5 EASY STEPS.



Step right up to a great value. If you've been going around in circles to find the best deal on a VCRS™ module along with a great programming package, look no further. Here's an easy way to get what you need, and more, for one low price:

1. **The module.** We'll deliver it to you in a week—or less! So you won't miss a minute of the great programming that's also part of this package.
2. **Multiplex HBO & Cinemax.** We've expanded, so now you get *three* channels of HBO® and *two* of Cinemax®. Each channel has its own daily schedule with different programming selections. And with our East and West coast feeds of HBO, HBO 2 and Cinemax, you get eight exciting choices—and it's all for the same low price!
3. **SuperPak Plus** includes 26 of your favorite basic channels, like CNN, ESPN®, American Movie Classics, Headline News and TBS, in one great package.
4. **A free multiplex HBO and Cinemax long-sleeve T-shirt.** Made of 100% cotton, this unique and colorful shirt is a $19.95 value.
5. **Call and get it all for only $600.** This special low price is available only for a *limited time.* It includes the VCRS module, all the great programming you could want plus your free T-shirt.

Just step over to the phone. Call **1-800-444-1100** 8 AM-11 PM Eastern Time, Monday-Saturday, or from 12 noon-9 PM Eastern Time, Sunday, for this great package. A value like this is hard to walk away from!

Programming only (315) verified w/HBO	$600
Decoder	$285

HBO SATELLITE SERVICES INC

ALL THIS FOR ONLY $600

*The HBO Guarantee: If any of the currently unscrambled channels in SuperPak Plus scramble during the life of your subscription, you'll continue to receive them for the duration of your existing SuperPak Plus subscription. (Does not include cost of additional equipment, if necessary.) PrimeTime 24 is available in all areas where network channels are not clearly received and is not available to customers who have received cable in the past 90 days. Certain ESPN events are subject to local blackout. Price guaranteed through March 31, 1993. American Movie Classics is a service mark of American Movie Classics Co.

CARTOON NETWORK NEW

NATIONAL SUPPLIERS	PHONE NUMBER	BASICS	NETWORK PACKAGES	SUPERSTAT.	PREMIUM CHANNELS	ADULT SER.	REGIONAL	SPECIALITY VICES	VC II PLUS	VIDEOPAL AVAIL.
GALAXY SATELLITE PROGRAMMING	(800)289-8876	20	2	ALL	6	2	YES		YES	
JONES PROGRAMMING	(800) 395-9555	17	2	ALL	5		YES			
NATIONAL PROGRAMMING SERVICE	(800) 444-DISH (3474)	18	2	ALL	5	2	YES	2	YES	
PROGRAMMERS CLEARING HOUSE	(800) 658-4770	19	2	ALL	5		YES		YES	YES
PROGRAMMERS WAREHOUSE	(800) 844-6444	18	2	ALL	5	2	YES	2	YES	
SATELLITE RECEIVERS PROGRAMMING CENTER	(800) 432-8876	18	2	ALL	6	2	YES		YES	YES
SATELLITE SOURCE	(800) 477-1234	18	2	ALL	5	2	YES	1	YES	
TELE-MEDIA	(800) 966-8876	18	2	ALL	5	2	YES			
TURNER VISION	(800) 344-6634 (24 hrs.)	17	2	ALL	5	2	YES			

VCRS PRICE	$399.00
	(39.95)
	$359.05

SUBSCRIBERS:
Do not send this special offer certificate directly to *Satellite ORBIT*.
It must be processed through your local satellite systems dealer.

Dealer #

(If you have recently subscribed or renewed you may still take advantage of these savings by completing and returning the form to your satellite dealer. This offer will take effect when your current subscription has expired.)

Dear Satellite Dealer: Subscriptions for this special offer must be mailed to CommTek Communications, 5257 Fairview Ave, Suite 110, Boise, ID 83706.
Collect the amount of the subscription and we will bill you later.

013A

Joseph Lundgren. Two genetically engineered super-soldiers begin to relive the Vietnam War-era horrors that turned them against one another. (Adult lan-

23rd (5:00a, 2:00a), 24th (5:00a), 28th (3:30a), 28th (3:30a), 30th (3:30a).

PPV highlights section for ordering information and the PPV section's highlights page.

GET A BIG BREAK ON THE ENTERTAINMENT PACKAGE WE'VE EVER RACKED